

# SunSet™ xDSL

July 1997

rev A



## PRELIMINARY SPECIFICATIONS

### CONNECTORS

ADSL interface: RJ45 and Bantam.  
POTS interface: RJ11 handset.  
Serial Port - 8 pin Mini DIN RS232C (V.24), DTE.  
DC power jack.

### DIGITAL DMM

DCV: 500 Volt full scale, +/- 1%.  
ACV: 400 Volt full scale, +/- 1%.  
DCA: 400 mA full scale, +/- 1%.  
ACA: 400 mA full scale, +/- 1%.  
Resistance: 40 Mohm full scale, +/- 1%.  
Capacitance: 40 uF full scale, +/- 1%.

### DIGITAL TIMS

Wideband TIMS: 20 kHz to 1.1 MHz, 200 Hz to 3.4 kHz.  
IEEE 743 F & G filter noise measurement.  
Signal to Noise (S/N) measurement.  
Sweep tone generation: 20 kHz to 1.1 MHz, 200 Hz to 3.4 kHz.

### TDR

Range: 0 to 18,000'.  
Adjustable velocity: 0.4 to 1.0.  
Pulse: 10 Vpp, 20 to 500 nanosecond.  
Display results to LCD screen.  
Store 3 previous test results in graphical format.

### ALCATEL ADSL PLUG-IN MODULE

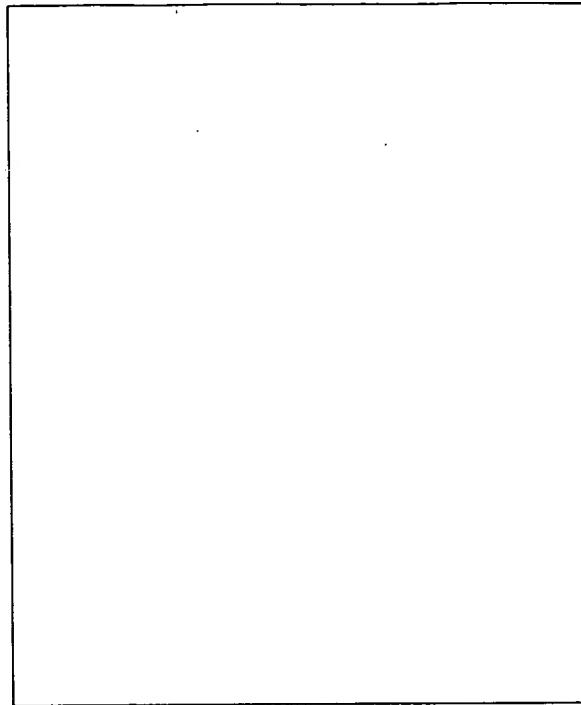
Alcatel 3.0 chip set implementation.  
Establish ADSL link with far end modem.  
Up/down stream bit rate verification and BERT test.  
Other modules to be announced.

### POTS SPLITTER EMULATION

Emulate POTS splitter applications.  
Provide direct handset interface/built-in hook control.  
POTS shunt circuit on/off control.

### GENERAL

Size: 10.5 x 6 x 27 cm (4 x 2.4 x 10.5")  
Weight: 1.3 Kg (2.8 lb)  
Construction: PC+ABS high-impact plastic.  
Display: 32x16 graphic LCD with backlight.  
18 bi-color LEDs.  
Battery: Rechargeable, field-replaceable NiMH pack.  
Provides 5 hrs of continuous use (nominal).  
Charger: Universal design with IEC power cable connector.  
11 x 6 x 3.5 cm (4.3 x 2.4 x 1.4") with 122 cm (4')



extension cable attached.

9.75 oz.  
100 VAC - 240 VAC input.  
15 VDC, 2A output.  
Fast recharge in 3 hours (nominal).  
UL, CSA, CE approved.  
Upgrade options via field-replaceable SunWare™ cartridge.

### ENVIRONMENTAL

Operating temperature: 0 to 50 °C (32 to 122 °F)  
Storage temperature: -20 to 70 °C (-4 to 158 °F)  
Humidity: 5% to 90% noncondensing

Note: Specifications subject to change without notice.

Transmit range: -4 dBm to -14 dBm

## STATUS/ALARM INDICATORS

Current and History status

T1-Line 1 & 2: Signal, Frame, Alarm, Idle/Disconnect, Error

T3-Line 1 & 2: Signal, Frame, Alarm, Error

SONET-Line 1 & 2: Signal, Frame, Pointer, Alarm, Error

## TEST PATTERN GENERATOR

General: 1111, 0000, 1010, 1000

Programmable: 10 sets, 16 bits

PRBS :  $2^n - 1$ , n = 9, 11, 15, 20, 23, QRS

T1 rate add : 55 Oct, T1-6, DDS1-6, 1:7, 3-in-24

## MEASUREMENTS

G.821, G.826 and general errors: Bit error, bit error rate, errored seconds, % errored seconds, severely errored seconds, % severely errored seconds, error-free seconds, % error-free seconds, available seconds, unavailable seconds, sync loss seconds, degraded minutes  
SONET: Signal loss second, frame loss second, loss of clock second, out of frame, loss of pointer second, path AIS second, line AIS second, path yellow second, FEBE second, section CV B1, line CV B2, path CV B3, BPV, Positive/Negative pointer adjustments, APS counts, Path FEBE, frequency, new pointer

DS3: Frame loss seconds, loss of signal seconds, BPV, BPV rate, F-bit error, F-bit error rate, P-bit error, C-bit error, FEBE, AIS seconds, yellow alarm seconds, frequency

DS2: F-bit error, frame loss seconds, AIS seconds, signal loss seconds

DS1: BPV, BPV rate, F-bit error, bit error, CRC-6 block error, CRC-6 block error rate, BPV, out of frame count, change of frame alignment count, frequency, level, AIS seconds, loss of frame seconds, loss of signal seconds, yellow alarm seconds, low density seconds, excess zeroes seconds, frequency

VT1.5: VT LOP seconds, FEBE, VT yellow alarm seconds, VT AIS seconds, BIP-2 error, VT pointer Positive/Negative adjustment, New Data Flag

Measurement Mode : Single, Repeat, Manual

Measurement duration:

Continuous

Timed, up to 100 days

Programmable start and stop time

Start date YY:MM:DD

Start time HH:MM:SS

Print results

Timed : every 1 to 9999 minutes

Last : at the end of measurement

Event : when an event occurs

## OTHER MEASUREMENTS

### View Received Data

View T1 data in binary, hex, ASCII

Shows data in bytes by time slot

### Bridge Tap

Automated transmission and measurement of 21 different patterns to identify possible bridge taps on line.

### CSU & NI Loopback Control

In-band Codes

CSU, NI, 100000

10 programmable user patterns

ESF-FDL

Payload, Line, Network

10 programmable user patterns

### Westell & Teltrend Looping Device Control

Automated looping of Westell and Teltrend line and central office

repeaters. Includes SF and ESF modes, arm, loop up/down, loopback query, sequential loopback, power loop query, span power down/up, unblocking.

### ESF Facility Data Link

Read and Send T1.403 message on FDL (PRM and BOM)

Automatic HDLC protocol handling

YEL ALM, LLB ACT, LLB DEA, PLB ACT, PLB DEA

AT&T 54016 24 hour performance report retrieval

T1.403 24 hour PRM collection per 15 min interval

### SLC-98 Data Link

Send and receive message

WP1, WP1B, NOTE formats

Alarms, switch-to-protect, far end loop

To TR-TSY-000008 specifications, mode I and III

### Westell & Teltrend PM NIU and MSS

Supports Westell and Teltrend performance monitoring network interface unit and maintenance switch system with ramp. Set/ query NIU time and date. Query performance data by hour or all. Reset performance registers. Read data over RAMP line. Perform maintenance switch.

### DOS Basic Package

Test rates: 2.4, 4.8, 9.6, 19.2, 56, 64 kbps

Patterns: 2047, 511, 127, 63, all 1s, all 0s, DDS-1, DDS-2, DDS-3, DDS-4, DDS-5, DDS-6, 8-bit user, alternating 1010

Loopbacks: Latching, interleaved. CSU, DSU, OCU, DSO-DP, 8-bit user

Measurements: Bit errors, Bit error rate

Control code send/receive: abnormal, mux out-of-synch, idle

### Switched 56 Tests

Switched 56 call set up and bit error rate testing  
Teleos signaling sequence timing analysis and dial digits decoding

### Fractional T1

Error measurements, channel configuration verification

Nx64 Kbps, Nx56 Kbps, N=1 to 24

Sequential, alternating, or random channels

Auto scan and auto configure to any FT1 order

### VOICE FREQUENCY CAPABILITIES

Monitor speaker with volume control for Line 1 & 2

View all 24 channel A,B (C,D) bits for Line 1 & 2

Control A,B (C,D) bits (E&M ground/loop start, FXO, FXS, on/off hook, wink)

Companding law - u or A

Programmable idle channel A, B (C, D) bits

Selectable idle channel code, 7F or FF hex

VF Level and Frequency Measurement

Level: +3 to -60 dBm, resolution 0.1dBm

Frequency: 50 to 3950 Hz, resolution 1 Hz

VF tone generation

Variable tone: 50 to 3950 Hz @ 1 Hz step. +3 to -60dBm @ 1dBm

Fixed tones: 404, 1004, 1804, 2713, 2804 Hz @ 0dBm and -13dBm

### Noise Analysis

Signal to noise (S/N)

Noise with filters:

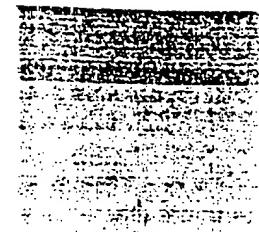
3 kHz flat, C-message, C-notch

### MF/DTMF/DP Dialing, Decoding/Analysis

MF/DTMF/DP dialing up to 32 digits, 10 user programmable quick dial number for each tone type



MFRI digits, 0 - 9, KP, ST, ST1-3, Pause  
DTMF digits, 0 - 9, \*, #, A, B, C, D, Pause  
DP digits, 0 - 9, Pause  
MF/DTMF decode up to 40 received digits. Analyze number, high/low frequencies, high/low levels, twist, tone period, interdigital time.  
Analyzer dynamic range: 0 to -25 dBm  
DP decode up to 40 digits. Analyze number, %break, PPS, interdigital time.  
Programmable interdigital period, tone period, and tone level (MF, DTMF)  
Programmable %break and interdigital period @ 10 pps (DP)



### **Signaling Analysis**

Analyze mode:  
Tracer on A, B (C, D) signaling state changes for Line 1 & 2 with time stamps  
MFRI - timing analysis of signaling transition states and dialing digits decoding of MFRI signaling  
MFRI1M - Modified MFRI CO switches signaling analysis  
MIXTONE - Decode a signaling sequence that has both MF and DTMF digits

### **PROTOCOL ANALYSIS**

#### **SS7**

Layer 2, 3, 4 analysis to bit level  
SU traffic analysis:  
Counters for FISU, LSSU, TUP, ISUP, SNM, SNT messages  
Counters for FIB and BIB retransmissions  
% analysis on different types of messages

MSU tracer:  
User programmable trace filter; CIC, DPC, OPC, H1H0, Signalling address.  
View bi-directional real time message flow.  
Messages are interpreted up to layer 4 or displayed in hex format.  
The trace storage holds up to 1000 messages.

### **ISDN**

Bi-directional Primary Rate Access (PRI)  
User programmable trace filter, view bi-directional real time message flow. Messages are interpreted up to layer 3 or displayed in hex format.  
Trace storage holds up to 1000 messages with time stamps  
Voice and data call set up and receive  
Built-in microphone and speaker for B channel talk/listen  
Bit error rate test with G.821 analysis  
Generates 2047, 511, 127, 63, all 1s. all 0s, and user programmable 8 bit test patterns  
Supports Nx64K and Nx56K data calls  
Programmable received data call loop back or send test pattern  
Supports 23B+D, 47B+D, and 46B+D+D  
NT & TE emulation  
National ISDN-2, AT&T 5ESS, ETSI, and Northern Telecom DMS-100 compatible  
On-screen help for special optional call feature programming

### **GENERAL**

Two PCMCIA slots for firmware cards, data storage and features update  
Internal NVRAM data buffer  
120 mm x 90 mm Color LCD with backlight  
Remote control with TL1 command language  
Bench top or rack mount operation  
19 inch or 23 inch rack mount kit with front patch panel

Power Supply : 90 - 260 VAC, 47 - 63 Hz  
Operating Temperature : 0°C to 50°C  
Storage Temperature : -20°C to 60°C  
Humidity : 20% to 85% non-condensing  
Size : 254 mm(W) x 178 mm (H) x 330 mm (D)  
Weight : 4 Kg (approx)